REMARKS

In the present Amendment, claim 19 has been amended to incorporate the subject matters of claims 22 and 23. Accordingly, claims 22 and 23 have been cancelled. Claim 24 has been amended to correct its dependency. No new matter has been added, and entry of the Amendment is respectfully requested.

Upon entry of the Amendment, claims 1-21 and 24-26 will be pending.

Claim 6 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because it depends from two claims.

In response, claim 6 has been amended to incorporate the subject matter of claim 3 and to no longer refer to claim 3. Accordingly, reconsideration and withdrawal of the § 112 rejection of claim 6 are respectfully requested.

Claims 5, 13, 14 and 17-24 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Smothers, U.S. 4,917,977.

Applicant submits that this rejection should be withdrawn because Smothers does not disclose or render obvious the present invention.

Smothers discloses only a one-photon absorbing compound. In contrast, a two-photon absorption compound is employed in a step of producing a latent image in the present invention.

As shown in the following chart, the principle of recording and reproduction between the present invention and Smothers is different.

	Recording Method	
Present Invention	Bit Recording	Two-photon Compound
Smothers	Diffraction, Hologram Recording	One-photon Compound

As to claim 20, the Examiner asserts that "claim 20 does not require a two photon exposure, merely use of the recited composition with an exposure process. The two photon exposure limitation does not appear until claims 25 and 26, so it is clear that single photon exposures are embraced by the claims rejected under this heading."

Applicant respectfully disagrees. Claim 20 clearly recites "performing a recording by using the two-photon absorbing polymerizable composition."

Accordingly, the present claims are not anticipated by Smothers.

In view of the above, reconsideration and withdrawal of the § 102(b) rejection of claims 5, 13, 14 and 17-24 based on Smothers are respectfully requested.

Claims 19-26 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Akiba et al, JP 2003-073410.

Applicant submits that this rejection should be withdrawn because Akiba et al do not disclose or render obvious the present invention.

Claim 19 relates to a two-photon absorbing polymerizable composition comprising a two-photon absorbing compound, a polymerization initiator, a polymerizable compound and a binder, in which the two-photon absorbing polymerizable composition is capable of generating a three-dimensional modulation of refractive index as a result of photo-polymerization caused by non-resonant two-photon absorption. The three-dimensional modulation of refractive index requires that the monomer and the binder differ in the refractive index and that the monomer transfers at its polymerization.

Akiba et al do not teach or suggest "the three-dimensional modulation of refractive index" as recited in present claim 19. Accordingly, claim 19 is not anticipated by Akiba et al.

Claims 20, 21, 24-26 are not anticipated by Akiba et al by virtue of their dependency from claim 19.

In view of the above, reconsideration and withdrawal of the § 102(b) rejection of claims 19-26 based on Akiba et al are respectfully requested.

Claims 1-2, 5, 9, 10, 13, 14 and 17-26 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Smothers, in view of Diamond et al, "Two-photon holography in 3-D photopolymer host-guest matrix", Optics Express, Vol. 6(3) pp. 64-68 (01/2000) and Akiba et al.

Applicant submits that this rejection should be withdrawn because Smothers, Diamond et al and Akiba et al do not disclose or render obvious the present invention, either alone or in combination.

Smothers discloses a single step process for forming a light-stable hologram using a disclosed photosensitive composition (Abstract). Diamond et al disclose "one-step in-situ two-photon holography at an arbitrary point within a gel cube containing photopolymers, which involves a photopolymerization reaction initiated by a highly efficient two-photon fluorophore (last paragraph at page 68)." Neither Smothers nor Diamond et al discloses a two-photon absorbing polymerization method comprising "a first step of irradiating light capable of a two-photon absorption to form a latent image; and a second step of exciting the latent image to cause a polymerization" as recited in the present claim 1. Akiba et al do not make up for the deficiencies of Smothers and Diamond et al.

Further, as discussed above, Smothers does not teach or suggest a two-photon absorbing compound, which is required in a step of producing a latent image in the present invention.

Also, the principle of recording and reproduction between the present invention and Smothers is different. Diamond et al and Akiba et al do not make up for the deficiencies of Smothers.

Accordingly, the present claims are not obvious over Smothers in view of Diamond et al and Akiba et al. Reconsideration and withdrawal of the § 103 (a) rejection of claims 1-2, 5, 9, 10, 13, 14 and 17-26 based on Smothers in view of Diamond and Akiba et al are respectfully requested.

Claims 19-21 and 25-26 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Lipson et al, U.S. 6,512,606.

As noted, claim 19 has been amended to incorporate the subject matters of claims 22 and 23, which are not subject to this rejection.

Accordingly, reconsideration and withdrawal of the § 102 (b) rejection of claims 19-21 and 25-26 based on Lipson et al are respectfully requested.

Claims 1-2, 5, 17-21 and 25-26 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Lipson et al, in view of Megens et al, U.S. 2003/0129501, and Belfield et al "Near-IR two photon absorbing dyes and photoinitiated cationic polymerization", Polymer Preprints, Vol. 41(1) pp. 578-579 (03/2000).

Applicant submits that this rejection should be withdrawn because Lipson et al, Megens et al and Belfield et al do not disclose or render obvious the present invention, either alone or in combination.

Firstly, Megens et al do not disclose a two-photon absorption.

Secondly, the Examiner contends that Megens et al teaches "incorporation of a neutralizer to cationically curable compositions, ... so that exposure at room temperature does not significantly catalyze polymerization," which means prevention of the refractive index

changes ([0038-0044]). However, Applicant submits that Megens et al teach at [0010] that "[t]he neutralizer molecules are able to neutralize a portion of the products of the photo-chemical reactions." Further, Megens et al teach that "[t]he exposing step is done at a temperature that inhibits or prevents the products from causing the refractive index changes [0011]." The purpose of using a neutralizer in Megens et al is not to prevent polymerization as asserted by the Examiner.

Therefore, Applicant respectfully submits that the Examiner's position of "[i]t would have been obvious to modify the process of Lipson et al by adding a neutralizer when forming the fringes and thereafter heating the composition to initiate polymerization to preserve the fringe structure and to use a two photon recording process to allow the formation of localized gratings as taught by Belfield et al" is not reasonable.

Further, Applicant points out that no neutralizers are employed in the present invention.

In view of the above, reconsideration and withdrawal of the § 103(a) rejection of claims 1-2, 5, 17-21 and 25-26 based on Lipson et al, in view of Megens et al and Belfield et al are respectfully requested.

Claims 1-2, 5, 9, 10, 13, 14 and 17-26 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiba et al, in view of Megens et al, and Belfield et al and Lipson et al.

Applicant submits that this rejection should be withdrawn because Akiba et al, Megens et al, Belfield et al and Lipson et al do not disclose or render obvious the present invention, either alone or in combination.

The Examiner reasons that "[i]t would have been obvious to modify the media of Akiba including a binder rendered obvious above, using a two photon interferometric exposure such as that taught by Belfield and adding a neutralizer to prevent premature polymerization and a heating step to facilitate the imagewise polymerization as taught by Megens to resolve the fine fringe structure with a reasonable expectation of the binder not affecting the suitability of the composition for holography based upon the teachings of Lipson."

Firstly, as discussed above, Akiba et al do not teach or suggest "the three-dimensional modulation of refractive index" as recited in present claim 19.

Secondly, the Belfield et al's two photon exposure is a one step photoinitiated polymerization (see, Conclusions). Adding a neutralizer taught by Megens into the media of Akiba et al which is subjected to the Belfield et al two photon exposure would not prevent premature polymerization as discussed above. In addition, the present invention does not include "a neutralizer." Further, only the second step in Lipson et al is a two-photon absorption by the PAG (photoacid generator) (col. 15, line 65). The combination of teachings of Akiba et al, Megens et al, Belfield et al and Lipson et al would not arrive at the present invention.

In view of the above, reconsideration and withdrawal of the § 103(a) rejection of claims 1-2, 5, 9, 10, 13, 14 and 17-26 based on Akiba et al, in view of Megens et al, Belfield et al and Lipson et al are respectfully requested.

Claims 19-21 and 25-26 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by DeVoe et al, WO 01/96917.

As noted, claim 19 has been amended to incorporate the subject matters of claims 22 and 23, which are not subject to this rejection.

Accordingly, reconsideration and withdrawal of the § 102 (b) rejection of claims 19-21 and 25-26 based on DeVoe et al are respectfully requested.

Claims 5 and 18-21 have been rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Lungu, U.S. 2006/0160025.

Applicant submits that this rejection should be withdrawn because Lungu does not disclose or render obvious the present invention.

Applicant submits that Lungu does not disclose "a two-photon absorbing compound" with the limitations recited in present claims 5 and 19. In addition, claim 19 has been amended to incorporate the subject matters of claims 22 and 23, which are not subject to this rejection. Accordingly, claims 5 and 19, and claims 18 and 20-21 dependent therefrom, respectively, are not anticipated by Lungu.

In addition, Applicant submits that the Examiner's reasoning of "[a]s there is a one photon absorption there will be a two photon absorption" is not reasonable, because two photon absorption occurs at a wavelength where one photon absorption does not occur.

In view of the above, reconsideration and withdrawal of the § 102(e) rejection of claims 5 and 18-21 based on Lungu are respectfully requested.

The Examiner has set forth the following four rejections in paragraph Nos. 13 to 16 of the Office Action.

Claims 5 and 18-21 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Wada, JP 61-183644.

Claims 5 and 18-21 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Arakai et al, JP 59-178488 [sic., JP 59-178448].

Claims 5 and 18-21 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Fujikawa et al, U.S. 5,698,373.

Claims 5 and 18-21 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Jolly et al, WO 80/01846.

Applicant submits that the above § 102(b) rejections of claims 5 and 18-21 based on Wada, Arakai et al JP '448, Fujikawa et al and Jolly et al, respectively, should be withdrawn for essentially the same reasons that the § 102(e) rejection of claims 5 and 18-21 based on Lungu should be withdrawn as discussed above.

Claims 19-21 and 25-26 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Fleming et al, WO 01/96961.

As noted, claim 19 has been amended to incorporate the subject matters of claims 22 and 23, which are not subject to this rejection.

Accordingly, reconsideration and withdrawal of the § 102 (b) rejection of claims 19-21 and 25-26 based on Fleming et al are respectfully requested.

Claims 5, 17-21 and 25-26 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fleming et al.

Applicant submits that this rejection should be withdrawn because Fleming et al do not disclose or render obvious the present invention.

Applicant submits that Fleming et al do not disclose two-photon absorption or a two-photon absorbing compound with limitations recited in present claims 5 and 19. In addition, claim 19 has been amended to incorporate the subject matters of claims 22 and 23, which are not subject to this rejection. Accordingly, claims 5, 17-21 and 25-26 are not obvious over Fleming et al.

Reconsideration and withdrawal of the § 103 (a) rejection of claims 5, 17-21 and 25-26 based on Fleming et al are respectfully requested.

Claims 1-8, 15-21 and 25-26 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fleming et al, in view of DeVoe et al, Arakai et al and JP 74-015490.

Applicant submits that this rejection should be withdrawn because Fleming et al, DeVoe et al, Arakai et al and JP '490 do not disclose or render obvious the present invention, either alone or in combination.

Applicant submits that none of the cited references discloses two-photon absorption or a two-photon absorbing compound as recited in the present claims. Accordingly, claims 1-8, 15-21 and 25-26 are not obvious over the combination of the cited references.

Reconsideration and withdrawal of the § 103 (a) rejection of claims 1-8, 15-21 and 25-26 based on Fleming et al, in view of DeVoe et al, Arakai et al and JP '490 are respectfully requested.

Claims 1-26 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fleming et al, in view of DeVoe et al, Arakai et al and JP '490, further in view of Akiba et al.

As noted above, claims 22 and 23 have been cancelled, leaving claims 1-21 and 24-26 as being subject to this rejection.

Applicant submits that this rejection should be withdrawn because Fleming et al, DeVoe et al, Arakai et al, JP '490 and Akiba et al do not disclose or render obvious the present invention, either alone or in combination.

Applicant submits that none of the cited references discloses two-photon absorption or a two-photon absorbing compound as recited in present claims. Accordingly, claims 1-21 and 24 26 are not obvious over the combination of the cited references.

Reconsideration and withdrawal of the § 103 (a) rejection of claims 1-21 and 24-26 based on Fleming et al, in view of DeVoe et al, Arakai et al and JP '490, and further in view of Akiba et al are respectfully requested.

The Examiner sets forth seven obviousness-type double patenting rejections as follows:

Claims 1-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1-20 of co-pending application 11/510,656 (US 2007/0048666).

Claims 1-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1-40 of co-pending application 10/874,344 (US 2005/0003133).

Claims 1-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1-19 of co-pending application 10/925,086 (US 2005/0058910).

Claims 19-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1 and 5-18 of co-pending application 10/804,144 (US 2004/0204513).

Claims 1-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1-29 of co-pending application 11/360,439 (US 2006/0194122).

Claims 1-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1-21 of co-pending application 11/509,563 (US 2007/0047038).

Claims 1-26 are provisionally rejected for obviousness-type double patenting as allegedly being unpatentable over claims 1-23 of co-pending application 11/359,566 (US 2006/0188790).

Since each of the above double patenting rejections is provisional, Applicant would like to defer responding at the present time.

Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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